

# Problems With This Current Design of The Shoe Display

## Door:

- As you guys saw in the video, the door being too heavy was a pretty big problem. For V1, I used a 25KG servo, which worked well, but it lacked a little power. To fix this, there are several things you can do:
  - Get a larger servo
  - Add some sort of gearbox to the servo
  - Add a second servo
  - There are probably more solutions, but these are the ones I'm thinking of right now

## UV Protection:

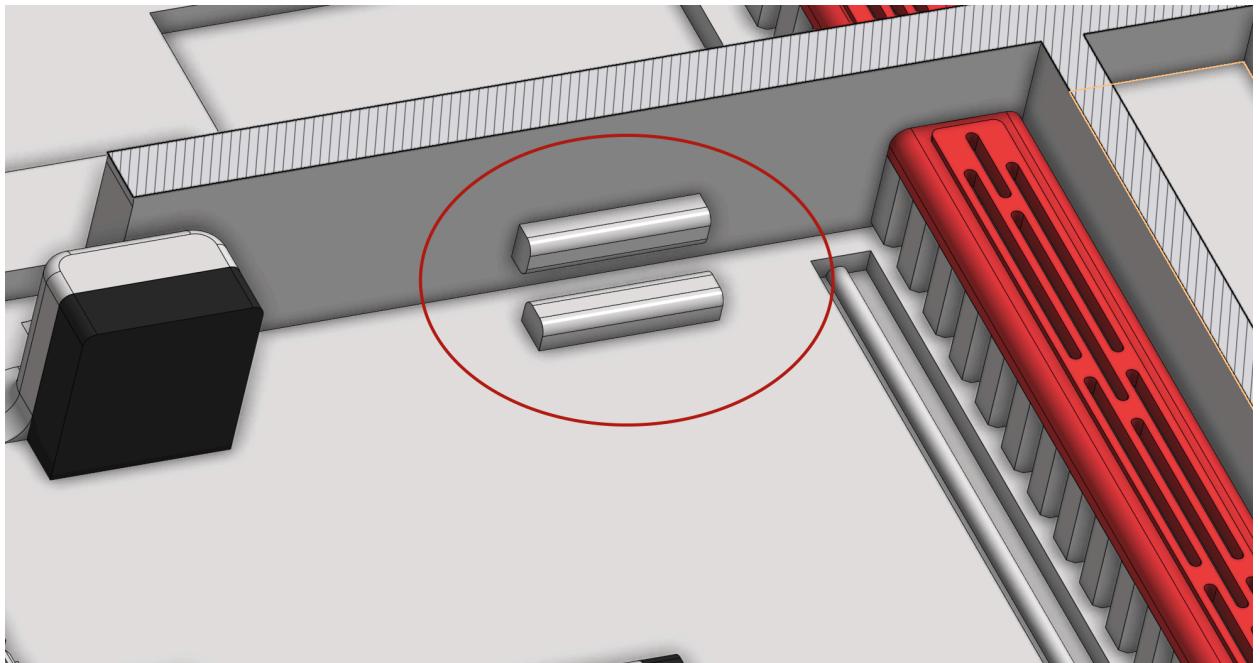
- Since the door was too heavy, we had to ditch any UV protection for some clear plastic wrap that kept the Chlorine dioxide in. Now, I was gonna use some window tint that I found on Amazon, but looking at it now, I don't think that was a good idea either. If I were to do this again, I would look into some sort of clear polycarbonate panel. Apparently, polycarbonate can block a lot of the UV spectrum, and I think it would definitely be worth looking into for V2 of the Shoe Display.

## UVC LED Design:

- I left the UVC LED board design out of my materials list, and that's because it was full of problems. For starters, I originally wanted to connect it directly to my 24V power supply for simplicity, and so I had some pretty large resistors on it to lower the voltage for the UVC LEDs. However, those resistors did not have a high enough Watt rating, and they got extremely hot. That's why in the code, I made them only turn on for 1 minute at a time, and then let them cool off for another minute or so. I also added a pull-down resistor to the design for the MOSFET, but I think I added it in the wrong spot, and it actually caused the MOSFET to always stay closed. If I were to design this again, I would make the input voltage closer to the LED's voltage, and I would put the pulldown resistor in the right spot.

## Base Cracking:

- The base was too big to print in one piece on my printer, so I cut it up. To connect the pieces, I wanted to reuse some of the 2020 aluminium bars that I got from my old Ender 3 3d printer, and to do that, I made these special rails:



Now, along with some glue, these did work pretty well. They made the assembly easy, and I was able to reuse some stuff. However, I did notice that after a while of moving the shoe display to different locations, the base had started to split apart there.



To fix this, I could've probably used some stronger glue, but I think some sort of bracket would've been a better solution.

#### No Mounting Holes for Linear Actuator:

- Right now, the linear actuator is just sitting in the box, no mounts. I didn't see/think of the mounting holes at the time of designing the base, but I would definitely add them now.

#### No Door Detection:

- Right now, there is no detection of whether or not the door is actually open, so if the door fails to fully open, the shoe bed will still try to move out. This will most likely cause the door to break.

#### No Shoe Bed Collision Detection:

- Right now, the shoe bed will move out until the limit switch is pressed. If objects are in the way of the bed, it will still continue to push through them, which might

break stuff. This is the same for moving the bed in. If objects fall behind the bed, it will try to crush them, which could break stuff.

## Pictures of the Shoe Display | CAD and Real Life

